

1.

11. (Newly added) A device as claimed in claim 4, wherein each of the intermediate layers of the AAF is a Ru layer.

REMARKS

This is responsive to the Office Action dated January 24, 2003, in which the Examiner rejects all the pending claims 1-10 as being either anticipated under 35USC §102(e) or being obvious under 35USC §103(a) over two Gill patents (U.S. Patent Nos. 6,129,209 and 6,275,363). Applicants have further amended independent claim 1 to include the limitation in Claim 3, as well as amended claims 3, 4, 6 and added claim 11, and respectfully traverse the rejection of the Examiner based on the amended claims and the following detailed explanation.

In particular, Applicants do not agree with the assertion of the Examiner that the features that “the free and the pinned ferromagnetic layer are separated by a Cu-type layer, the Cu-type layer on both sides being contiguous with a Co or CoFe layer”, as defined in the previous claim 3 and now included in the amended independent claim 1, are obvious over the cited Gill patents. There is no teaching or implication in Gill patents that the Cu-type separation layer is contiguous with a Co or CoFe layer as taught by the present invention, so as to eliminate diffusion resulted from interfacing Ni with Cu (see page 3, lines 18-19 of the Specification). In fact, there is no mention at all in Gill about the diffusion problem from the Cu/Ni interfacing. To the contrary, in both Gill patents, the Cu-type separation layer (spacer 722 in '209 patent and copper layers 302, 304 in '363 patent) is contiguous with a NiFe free layer (see col. 7, lines 33-37 and Figure 7 in '209 patent, as well as col. 8, lines 36 and Figure 12 in '363 patent). Thus, the diffusion problem may persist in Gill patents. Thus, the features as underlined above can not be found in the Gill patents.

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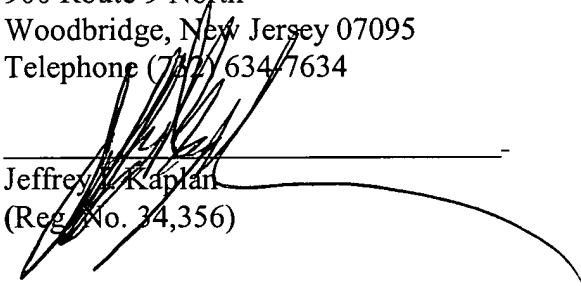
Therefore, amended independent claim 1, with the above underlined distinguishing features, is not obvious under 35USC §103(a) over the Gill patents, and is thus patentable. At least for the same reasons, all other claims 3-11 are also patentable for each having included all the limitations of claim 1.

Applicants therefore respectfully request reconsideration in view of the above remarks and amendments. The Examiner is authorized to deduct additional fees believed due from our Deposit Account No. 11-0223.

Respectfully submitted,

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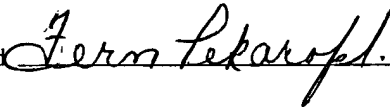
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal service as first class mail, in a postage prepaid envelope, addressed to Box RCE, Commissioner for Patents, Washington, D.C. 20231 on April 11, 2003.

Dated April 11, 2003

Signed



Print Name Fern Pekarofski

MARKED-UP VERSION OF AMENDED CLAIMS 1, 3, 4 and 6

1. (Thrice Amended) A magneto-resistive device comprising a free and a pinned ferromagnetic layer separated by a non-magnetic spacer layer therebetween for providing a magnetoresistive effect, said pinned layer comprising an artificial antiferromagnet layer system (AAF), and an exchange biasing layer, the exchange biasing layer being adjacent to and magnetically influencing the AAF layer system wherein [the AAF layer system has an odd number of non-adjacent ferromagnetic layers greater than or equal to three, and all said non-adjacent ferromagnetic layers are CoFe layers] the free and the pinned ferromagnetic layers are separated by a Cu-type layer, the Cu-type layer on both sides being contiguous with a Co or CoFe layer.
3. (Twice Amended) A device as claimed in claim 1, in which [the free and the pinned ferromagnetic layer are separated by a Cu-type layer, the Cu-type layer on both sides being contiguous with a Co or CoFe layer] the AAF layer system has an odd number of non-adjacent ferromagnetic layers greater than or equal to three.
4. (Twice Amended) A device as claimed in claim [1] 3, in which [each of the intermediate layers of the AAF is a Ru layer] the AAF layer system includes three CoFe layers and two intermediate non-magnetic layers.
6. (Twice Amended) A device as claimed in claim [1] 3, wherein within the odd number of non-adjacent ferromagnetic layers form a stack of layers.